

BISTABLE MOLECULAR SWITCHES AND ASSOCIATED METHODS

ABSTRACT OF THE DISCLOSURE

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A bistable molecular switch can have a highly conjugated first state and a less conjugated second state. The bistable molecular switch can be configured such that application of an electric field reversibly switches the molecular switch from the first state to the second state. Additionally, the bistable molecular switch can include a hydrophobic moiety and a hydrophilic moiety. Such molecular switches can be incorporated into a thin film as part of a molecular switch system which can include a layer of molecular switches between a first electrode layer and a second electrode layer. The layer of molecular switches can have substantially all of the molecular switches having their hydrophilic moiety oriented in the same direction. An electric potential can then be induced between the first and second electrode layers sufficient to switch the molecular switches from the first or second state to the second or first state, respectively. The first and second states have differences in resistivity which are suitable for use in electronic applications. Thin films containing these oriented molecular switches can be used to produce a wide variety of electronic components such as ROM memory and the like.

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